EXAMPLE 4

A SiGe buffer layer comprising two interruptions was deposited in a variable temperature process at reduced pressure from DCS and GeH4, according to the process described in Table 3. The temperature decreased from about 900° C. to about 800° C. over the course of the deposition process. Interruptions were provided in Steps 4 and 8.

TABLE 3

	STEP: 1	STEP: 2	STEP: 3	STEP: 4	STEP: 5
STEP NAME	PURGE	RAMP (5-10%)	FLAT	FLAT	FLAT
DURATION (min:seconds)	60	4:30	1:00	5	1:00
TEMPERATURE (° C.)	900	Ramp to 850	850	850	850
DEPOSIT OR VENT	VENT	DEPOSIT	DEPOSIT	DEPOSIT	DEPOSIT
H_2 FLOW (slm)	40	40	40	40	40
VENT_PRESSURE (torr)	80	80	80	80	80
DCS (sccm)	20	20	20	20 Vent	20
GeH_4 (sccm)	2	15 (ramp from 2 to 15)	15	15	15

	STEP: 6	STEP: 7	STEP: 8	STEP: 9	STEP: 10	STEP: 11
STEP NAME	RAMP (10-15%)	FLAT	FLAT	FLAT	RAMP (15-20%)	FLAT
DURATION (seconds)	6:45	1:00	3	1:00	6:05	10:30
TEMPERATURE (° C.)	Ramp to 825	825	825	825	Ramp to 800	800
DEPOSIT OR VENT	DEPOSIT	DEPOSIT	DEPOSIT	DEPOSIT	DEPOSIT	DEPOSIT
H_2 FLOW (slm)	40	40	40	40	40	40
VENT_PRESSURE (torr)	80	80	80	80	80	80
DCS (sccm)	20	20	20 Vent	20	20	20
GeH_4 (sccm)	27 (ramp from 15 to 27)	27	27	27	58 (ramp from 27 to 58)	58

What is claimed is:

1. A chemical vapor deposition (CVD) process for forming a strain relaxed SiGe buffer layer over a semiconductor substrate in a reaction chamber comprising:

flowing a silicon precursor and a germanium precursor into the reaction chamber to deposit SiGe in a first SiGe deposition phase;

interrupting the flow of the silicon precursor into the reaction chamber while continuing to flow the germanium precursor into the reaction chamber in a first interruption phase; and

resuming the flow of the silicon precursor into the reaction chamber while continuing to flow the germanium precursor into the reaction chamber to deposit SiGe in a second SiGe deposition phase, wherein the SiGe deposited in the second SiGe deposition phase comprises an increasing concentration of germanium.

2. The process of claim **1**, wherein an interface layer is formed in the SiGe buffer layer in the interruption phase.

3. The process of claim **2**, wherein the interface layer has a thickness of less than about 100 Å.

4. The process of claim **2**, wherein the interface layer has a thickness of less than about 50 Å.

5. The process of claim **2**, wherein the interface layer has a different composition than the SiGe buffer layer.

6. The process of claim **1**, wherein interrupting comprises stopping the flow of the silicon precursor into the reaction space for less than about 10 seconds.

7. The process of claim **6**, wherein interrupting comprises stopping the flow of the silicon precursor into the reaction space for less than about 5 seconds.

8. The process of claim **1**, wherein the temperature is held constant throughout the deposition process.

9. The process of claim **8**, wherein the temperature is between about 700° C. and about 1100° C.

10. The process of claim **1**, wherein the temperature is varied during the deposition process.

11. The process of claim **1**, wherein the silicon precursor is selected from the group consisting of silane, disilane, trisilane, dichlorosilane, trichlorosilane and tetrachlorosilane.

12. The process of claim **1**, wherein the germanium precursor is selected from the group consisting of $GeCl_4$, GeH_4 and digermane.

13. The process of claim **1**, wherein the silicon precursor is dichlorosilane and the germanium precursor is germanium tetrachloride.

14. The process of claim **1**, wherein the silicon precursor is DCS and the germanium precursor is germane.

15. The process of claim **1**, wherein the SiGe deposited in the first SiGe deposition phase has an increasing concentration of germanium.

16. A method for depositing a SiGe buffer layer with reduced defects on a substrate in a reaction chamber comprising continuously flowing a germanium precursor to the reaction chamber and flowing a silicon precursor to the reaction chamber, wherein the flow of the silicon precursor is interrupted one or more times, and wherein the SiGe deposited in the SiGe buffer layer after the first interruption comprises an increasing concentration of germanium.

17. The method of claim **16**, wherein the substrate comprises a bulk silicon layer.

18. The method of claim **16**, wherein the substrate comprises an epitaxially-deposited silicon layer.

19. The method of claim **16**, wherein the SiGe buffer layer comprises an increasing concentration of germanium from a lower interface with the substrate to an upper interface with an overlying layer.

20. The method of claim **19**, wherein the overlying layer is a strained silicon layer.

21. The method of claim **16**, wherein the ratio of germanium precursor to silicon precursor increases while flowing the silicon precursor to the deposition chamber.

22. A method of depositing a SiGe layer on a substrate in a reaction chamber comprising: